PATENT

AMENDMENTS TO THE CLAIMS

Following is a complete set of claims as amended with this Response. This complete set of claims excludes cancelled claims 14 and 19 and includes amended claim 13 and new claims 21-38.

1. (Withdrawn) A method of packaging a sensor device implantable in a living body, the method comprising:

(a) sealing an electrical conductor of the sensor device extending between proximal and distal ends in a non-conductive substrate;

(b) connecting an end of the electrical conductor to an external sensor on the sensor device;

(c) connecting a second end of the electrical conductor to a lead that is configured to connect to an implantable medical device;

(d) embedding the connection between the distal end of the electrical conductor and the external sensor in an insulative deposit of protective material; and

(e) encapsulating the external sensor, substrate, and insulative deposit of protective material in a hermetic material without interference with the lead.

2. (Withdrawn) A method of packaging as set forth in claim 1 and further comprising:

(f) intermediate steps (d) and (e), encapsulating the external sensor and the substrate in a layer of insulating material without interference with the lead.

3. (Withdrawn) A method of packaging as set forth in claim 2 wherein the substrate is composed of at least one of ceramic and glass.

4. (Withdrawn) A method of packaging as set forth in claim 1 wherein the external sensor is at least one of a temperature sensor and a pressure sensor.

PAGE 5/14 * RCVD AT 5/12/2006 12:40:25 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/9 * DNIS:2738300 * CSID:818 362 4795 * DURATION (mm-ss):03-44

5. (Withdrawn) A method of packaging as set forth in claim 1 wherein the pulse generator is a pacemaker.

6. (Withdrawn) A method of packaging as set forth in claim 1 wherein the pulse generator is a defibrillator.

7. (Withdrawn) A method of packaging as set forth in claim 1 wherein the hermetic material is at least one of titanium, gold, platinum, and carbon.

8. (Withdrawn) A method of packaging as set forth in claim 1 wherein the thickness of the thin film of hermetic material is in the range of about 10 nm to 0.1 mm.

9. (Withdrawn) A method of packaging as set forth in claim 2 wherein the insulating layer is parylene.

10. (Withdrawn) A method of packaging as set forth in claim 2 wherein the thickness of the layer of insulating material is in the range of about 5 nm to 0.5 mm.

11. (Withdrawn) A method of packaging as set forth in claim 2 wherein step (e) ensures the complete encapsulation of the layer of insulating material applied by step (f).

12. (Withdrawn) A method of packaging as set forth in claim 1 wherein step (c) includes the step of:

(f) inserting a pad of conductive material intermediate, and in electrical continuity with, the distal end of the lead and with the proximal end of the electrical conductor.

PAGE 6/14 * RCVD AT 5/12/2006 12:40:25 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/9 * DNIS:2738300 * CSID:818 362 4795 * DURATION (mm-ss):03-44

13. (Currently Amended) A sensor device implantable in a living body, the sensor device comprising:

an insulating substrate that defines a feedthrough region;

a sensor in contact with the insulating substrate;

an electrical conductor received in the feedthrough region;

a bond wire connected to the electrical conductor and to the sensor, wherein the bond wire is embedded in an insulative sheath;

a lead connected to the electrical conductor and configured for connection to an implantable medical device; and

~~wherein the sensor and the substrate are encapsulated in~~ a thin film of hermetic material encapsulating the sensor and the substrate, an inner surface of the thin film directly contacting an outer surface of the sensor and an outer surface of the substrate to form a voidless encapsulation of the sensor and the substrate.

14. (Cancelled

15. (Original) The implantable sensor device as set forth in claim 14 wherein the substrate is composed of at least one of ceramic and glass.

16. (Original) The implantable sensor device as set forth in claim 13 wherein the sensor is at least one of a temperature sensor and a pressure sensor.

17. (Original) The implantable sensor device as set forth in claim 13 wherein the hermetic material is at least one of titanium, gold, platinum, and carbon.

18. (Original) The implantable sensor device as set forth in claim 13 wherein the thickness of the thin film of hermetic material is in the range of about 10 nm to 0.1 mm.

PAGE 7/14 * RCVD AT 5/12/2006 12:40:25 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/9 * DNIS:2738300 * CSID:818 362 4795 * DURATION (mm-ss):03-44

19. (Cancelled)

20. (Original) The implantable sensor device as set forth in claim 13 and further comprising:

a pad of conductive material intermediate, and in electrical continuity with, the lead and with the electrical conductor.

21. (New) The implantable sensor device as set forth in claim 14 wherein the lead is an implantable lead to pace and sense a heart.

22. (New) An implantable medical device comprising:

a pulse generator;

an implantable lead having a distal portion and a proximal portion, the proximal portion connected to the pulse generator; and

a sensor device connected to the implantable lead, the sensor device comprising:

an insulating substrate that defines a feedthrough region;

a sensor in contact with the insulating substrate;

an electrical conductor received in the feedthrough region, the electrical conductor electrically coupled to the implantable lead;

a layer of insulating material encapsulating the sensor and the insulating substrate, an inner surface of the layer of insulating material directly contacting an outer surface of the insulating substrate and an outer surface of the sensor to form a voidless encapsulation of the sensor and the insulating substrate; and

a thin film of hermetic material encapsulating the layer of insulating material, an inner surface of the thin film of hermetic material directly contacting an outer surface of the layer of insulating material to form a voidless encapsulation of the layer of insulating material.

PAGE 8/14 * RCVD AT 5/12/2006 12:40:25 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/9 * DNIS:2738300 * CSID:818 362 4795 * DURATION (mm-ss):03-44

23. (New) The implantable medical device as set forth in claim 22 and further comprising:

a bond wire connecting the electrical conductor to the sensor; and

an insulative deposit of protective material embedding the bond wire;

wherein the layer of insulating material encapsulates the insulative deposit of protective material.

24. (New) The implantable medical device as set forth in claim 22

wherein a proximal end of the sensor device is connected to the distal end of the implantable lead.

25. (New) The implantable medical device as set forth in claim 22

wherein the substrate is composed of at least one of ceramic and glass.

26. (New) The implantable medical device as set forth in claim 22

wherein the sensor is at least one of a temperature sensor and a pressure sensor.

27. (New) The implantable medical device as set forth in claim 22

wherein the hermetic material is at least one of titanium, gold, platinum, and carbon.

28. (New) The implantable medical device as set forth in claim 22

wherein the thickness of the thin film of hermetic material is in the range of about 10 nm to 0.1 mm.

29. (New) The implantable medical device as set forth in claim 22

wherein the thickness of the layer of insulating material is in the range of about 5.0 nm to 0.5 mm.

PAGE 9/14 * RCVD AT 5/12/2006 12:40:25 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/9 * DNIS:2738300 * CSID:818 362 4795 * DURATION (mm-ss):03-44

30. (New) The implantable medical device as set forth in claim 22 wherein the implantable medical device is a cardiac pacemaker; and wherein the implantable lead paces and senses a heart.

31. (New) An implantable medical device comprising:

a pulse generator;

an implantable lead having a distal portion and a proximal portion, the proximal portion connected to the pulse generator; and

a sensor device connected to the implantable lead, the sensor device comprising:

an insulating substrate that defines a feedthrough region;

a sensor in contact with the insulating substrate;

an electrical conductor received in the feedthrough region, the electrical conductor electrically coupled to the implantable lead; and

a thin film of hermetic material encapsulating the insulating substrate and the sensor, an inner surface of the thin film of hermetic material directly contacting an outer surface of the insulating substrate and an outer surface of the sensor to form a voidless encapsulation of the insulating substrate and the sensor.

32. (New) The implantable medical device as set forth in claim 31 and further comprising:

a bond wire connecting the electrical conductor to the sensor; and

an insulative deposit of protective material embedding the bond wire;

wherein the thin film of hermetic material encapsulates the insulative deposit of protective material.

33. (New) The implantable medical device as set forth in claim 31 wherein a proximal end of the sensor device is connected to the distal end of the implantable lead.

34. (New) The implantable medical device as set forth in claim 31 wherein the substrate is composed of at least one of ceramic and glass.

PAGE 10/14 * RCVD AT 5/12/2006 12:40:25 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/9 * DNIS:2738300 * CSID:818 362 4795 * DURATION (mm-ss):03-44

35. (New) The implantable medical device as set forth in claim 31 wherein the sensor is at least one of a temperature sensor and a pressure sensor.

36. (New) The implantable medical device as set forth in claim 31 wherein the hermetic material is at least one of titanium, gold, platinum, and carbon.

37. (New) The implantable medical device as set forth in claim 22 wherein the thickness of the thin film of hermetic material is in the range of about 10 nm to 0.1 mm.

38. (New) The implantable medical device as set forth in claim 22 wherein the implantable medical device is a cardiac pacemaker; and wherein the implantable lead paces and senses a heart.

PAGE 11/14 * RCVD AT 5/12/2006 12:40:25 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/9 * DNIS:2738300 * CSID:818 362 4795 * DURATION (mm-ss):03-44